California P-16 Council

Subcommittee 1
Report and Recommendations

How do we make school more relevant to students?

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To answer the essential question, How can we make the achievement of standards matter to students, Subcommittee 1 focused on the question, How do we make school more relevant to students?

Rationale

In 2002, only about 71 percent of California students who entered the ninth grade persisted and graduated with a diploma in four years.[1] Moreover, an analysis by the Urban Institute clearly shows that these statistics are alarmingly worse for California's African-American and Latino youths. Figures for 2002 show that in California only 56.6 percent of African-American youths and 60.3 percent of Latino ninth graders completed the twelfth grade and graduated from high school in four years.[2] The precise number of students in California who actually dropout is unknown. Unfortunately, the state does not have a reliable system for collecting this information. However, even if one accepts the California Department of Education's (CDE's) conservative estimate of 13.1 percent (for 2003-04), most observers will agree that even that number is unacceptably high. The CDE estimates that about one-quarter of all African-American students will drop out of California high schools and about 17 percent each of Latino and Pacific Islander students will likewise dropout. Altogether, the CDE estimates that in California more than 61,000 young people drop out of grades nine through twelve each year.[3]

Changing this outcome is an enormous challenge for educators working to find effective strategies to reform secondary education. The majority of these reform efforts have focused on improving accountability for better results by shoring up curriculum and student performance standards, upgrading teachers' skills, and reorganizing high schools into smaller learning communities that are more conducive to personalized attention.

These reforms are all positive and important, but the persistence of dropout trends, especially among low-income minority youths, makes it clear that additional changes are needed not only to sustain student engagement but also to raise student achievement.

High schools must find ways to make school relevant for students. They must also develop a range of creative learning options so that students can choose the options that will best engage and challenge them to reach their full potential.

Findings from Research Studies

Students understand and retain more when their learning is relevant, engaging, and

[1] Christopher B. Swanson, *Who Graduates in California?* Washington, D.C.: The Urban Institutes, March 2005, p. 1.
[2] Ibid.
[3] Educational Demographics Unit. "Dropouts by Grade and Ethnicity, 2003-04." Sacramento: California Department of Education, 2004.

meaningful to their lives.[4] One way to make learning relevant is to connect the curriculum to the workplace. This connection gives students the opportunity to learn real-world applications and to solve problems in a work context. This approach makes the curriculum relevant for students and engages them in learning.[5]

In the 2005 report titled *High School Reform: National and State Trends*, six common characteristics of high-performing high schools were identified. One of the characteristics of a high-performing high school is that it offers a variety of instructional approaches that engage students and connect them to real-world applications.[6] This report indicates that high-performing high schools engage students in learning by making instruction relevant to their lives and interests.

The strategy of integrating a standards-based curriculum with a career focus is supported in *Breaking Ranks II: Strategies for Leading High School Reform*, which outlines 31 core recommendations for high school reform. Core recommendation 22 states, "The content of the curriculum, where practical, should connect to real-life applications of knowledge and skills to help students link their education to their future."[7] Recommendation 22 lists the following types of strategies that can be used to create a connection between the curriculum and real-life application of knowledge: project-based learning and curriculum, internships, service learning, career academies and career exploration in school.

Many students prefer a real-life application approach to instruction. For example, when students from a high school pre-engineering program were asked what suggestions they had for improving the quality of the program, they responded by saying they wanted "challenging, authentic projects to work on that require students to apply academic and technical knowledge."[8]

Subcommittee 1 believes that by connecting the curriculum to the workplace, educators can make school more engaging and relevant for students. The research cited previously supports this position. The members of Subcommittee 1 focused their attention on identifying educational models and options that meet the following three criteria: (1) promote effective academic engagement; (2) use contextual approaches for learning; and (3) tie formal education to the broader world of career, community, and engaged citizenship. Subcommittee 1 found that the California Partnership Academy model (CPA) met all three criteria.

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[4] *Learning for the 21st Century*. Washington, D.C.: Partnership for 21st Century Skills, 2004.
[5] Gene Bottoms, and Karen Anthony, *Project Lead the Way: A Pre-Engineering Curriculum That Works, A New Design for High School Career/Technical Studies*. Atlanta: Southern Regional Education Board, 2005.
[6] Catherine Walcott, Rose Owens-West, and Reino Makkonen, *High School Reform: National and State Trends*. San Francisco: WestEd, 2005, p. 14.
[7] *Breaking Ranks II: Strategies for Leading High School Reform.* Reston, Va.: National Association of Secondary School Principals, 2004, p. 124.
[8] Ibid.

Research on California Partnership Academies

The CPA model, which was established in California during the 1980s is a three-year program that spans grades ten through twelve and is structured as a school within a school. CPAs incorporate the following components:[9]

- Creation of a close family-like atmosphere
- A focus on student achievement
- The integration of a standards-based curriculum focused on academics and careers
- Mentors in the eleventh grade (CPA students are matched with mentors.)
- Internship programs (after their junior year, students performing well enough to be on track for graduation are placed in jobs.)
- A required common planning period for the teachers in a CPA
- An advisory committee consisting of individuals involved in the academic operations of the academy and representatives of the private sector
- Involvement of business partners who:
    - Serve on a CPA steering committee that oversees the program.
    - Help to develop the career-focused curriculum.
    - Provide speakers for CPA classes.
    - Host field trips to give students a perspective of the workplace.
    - Provide mentors who serve as career-related role models and personal points of contact in the field of training.
    - Provide jobs for students during the summer and part-time jobs during the school year.

In addition to the preceding components, established CPAs use all five of the strategies listed in core recommendation 22 in *Breaking Ranks II* to connect the curriculum to real-life applications.[10]

[9] California Partnership Academies. Program Overview. Sacramento: California Department of Education, 2006.
[10] *Breaking Ranks II*, p. 124.

State research on CPAs and national research on career academies support the academy instructional approach. Research conducted by the California Policy Research Center on CPAs found the following positive outcomes for students who participated in well-developed CPAs. Those students:

- Had increased grade point averages compared with students taking other high school programs (This finding is particularly true for at-risk students.)
- Had lower high school dropout rates
- Were more likely to attend postsecondary education
- Had a decreased need to take remedial English in college

Data from a CDE 2003-04 summary report on the CPAs also provide compelling evidence of positive outcomes for students in CPAs.[11] Ninety-five percent of the twelfth graders in CPAs graduated from high school. There was also a high rate for attendance and completion of coursework for the tenth and eleventh grade students in CPAs.

A national research study, the MDRC's career academies evaluation, launched in 1993 and still under way, assessed the impact that career academies had on students.[12] MDRC compared students in career academy programs with students in control groups. Key findings of the evaluation showed the following substantial positive outcomes for students in career academy programs who were at high risk of school failure:

- A decrease in drop-out rates and an increase in attendance rates and in the number of vocational and academic credits earned
- Positive effects on the labor market, such as an increase in wages, the number of hours worked, and employment stability, particularly among young men, who were at high or medium risk of dropping out of high school when they entered the program

Results from state and national research studies show that the career academy model increases positive student outcomes. Therefore, expansion of the successful CPA model to serve an increased number of high school students in California's secondary education system is a sound approach and one firmly grounded in research-based practice.

[11] Bernie Norton, Statistics Regarding CPA Enrollments." E-mail to Mary Donnelley-Ortega, December 6, 2005. See Appendix 1 "Summary of Data from the 2003-04 annual Report for California Partnership Academies," which appears at the end of this document.
[12] James Kemple, and Judith Scott-Clayton, *Career Academies: Impacts on Labor Market Outcomes and Educational Attainment*, New York: MDRC, 2004, p. iii.

Recommendation 1

On the basis of the preceding research, Subcommittee 1 offers the following recommendation:

Increase the number of CPAs, expand the CPA model to a four-year program, eliminate the current enrollment requirement for at-risk students, and make the curriculum developed for CPAs available to the public.

Specific activities to implement recommendation 1 follow:

- Increase the number of CPAs from the current 286 to 900.
- Expand the CPA model from the current three-year program for grades ten through twelve to a four-year model for grades nine through twelve.
- Eliminate the 50 percent at-risk student enrollment requirement for CPAs and continue to fund qualified students in CPAs at the current rate or higher.
- Make the curriculum and lessons developed for CPAs available to the public and post them on the CDE Web site or a public database.

Justification for Eliminating the 50 Percent At-Risk Enrollment Requirement

Subcommittee 1 believes that all high school students should have the option of enrolling in a CPA because that program provides them with an academically and a technically rigorous high school curriculum that prepares them for both college and a career. Continuing the 50 percent at-risk enrollment requirement for CPAs closes the options for many students who are not at risk.

For a program to receive funding as a CPA, at least one-half of the students enrolled must be at-risk, as indicated by at least three of the following criteria listed in *Education Code* Section 54690(s):

1. Past record of irregular attendance
2. Past record of underachievement in which the student is at least one year behind the coursework for the respective grade level
3. Past record of low motivation or a disinterest in the regular school program
4. Disadvantaged economically

Education Code Section 54691(s) provides for the enrollment of students in CPAs who are not at risk. It states the following:

> A school district operating an academy that is unable to enroll enough at-risk students . . . to constitute one-half of the participating students [on the bases of the criteria listed above] may enroll non-at-risk students that meet either of the following criteria:

1. Scoring in the 40th percentile or below in mathematics or English-language arts on the standardized test administered pursuant to Article 4 (commencing with Section 60640) of Chapter 5 of Part 33.

2. Maintaining a grade point average of 2.2 or below, or the equivalent of a C-.

It seems useful to distinguish state policy designed to promote academies as an effective option for delivering challenging high school curriculum from state policy designed to support participation of at-risk students in effective high school offerings. Current policy seems to combine and confuse these two objectives in counterproductive ways. The state should do both, but in a way that avoids the current implication that CPAs are intended mainly for at-risk students. There is no need for this limitation, and in fact, it may stigmatize CPAs in ways that are neither beneficial nor necessary.

A CPA should be defined as a program of academic and technical study designed for any high school student interested in participating in a program organized according to a major industry or career theme. If operating a CPA, on average, requires a higher level of expenditure per student than is needed to operate nonacademic programs, perhaps the state should consider providing an additional amount per student for all students enrolled in a CPA.

In some cases the 50 percent at-risk enrollment requirement for CPAs may actually hinder an at-risk student's education. For example, if a CPA becomes a dumping ground for truant or low-achieving students, the curriculum taught in CPAs may become watered down and less rigorous. Additionally, there is a widespread assumption that certain career themes such as pre-engineering or information technology are too challenging for at-risk students; however, other career themes such as health or construction technology are less challenging and therefore are well suited for at-risk students. In this case the 50 percent at-risk enrollment rule may discourage a district from establishing a pre-engineering CPA because the school and district administrators may believe that at-risk students cannot succeed in the more rigorous CPAs. As a result, the school and district might establish a pre-engineering academy outside the CPA framework, and no effort would be made on the school's behalf to recruit at-risk students into the academy. When any of these situations occur, the 50 percent at-risk enrollment requirement may contribute to an unintended but perverse outcome from the original intent of CPAs.

Justification for Expanding the Model to the Ninth Grade

Applying the components of the CPA model to the ninth grade may help address some of the critical issues for students transitioning into and out of the ninth grade and offer the additional academic and social supports that enable them to succeed in grades ten through twelve.

The report *Making Progress Toward Graduation: Evidence from the Talent Development High School Model* points out that in many low-performing high schools, a large percentage of ninth grade students either dropout or are held back. Failure of students to advance successfully and on time to the tenth grade is a major predictor of

their dropping out of high school. This report states, "In the pipeline leading toward graduation, the point of ninth-to-tenth-grade transition is less a leak than a rupture."[13] The Talent Development (TD) model is a reform initiative now being used in more than 80 schools in 20 districts nationwide. It is especially responsive to the challenge of helping young people make healthy transitions from middle school to high school and through high school to graduation. The TD model, developed by the Center for Research on the Education of Students Placed At Risk (CRESPAR) at Johns Hopkins University, is a part of a larger trend in educational reform that aims to improve student performance and engagement through major changes to both the organizational structure and educational processes of middle schools and high schools.

In high schools, the TD model encompasses five main features:

1. Small learning communities (a freshman academy and career academies for students in the upper grades)

2. Curricula leading to advanced English and mathematics coursework

3. Academic extra-help sessions, including catch-up reading and mathematics courses for ninth graders

4. Staff professional development strategies

5. Parent and community involvement in activities that foster students' career and college development[14]

The TD model produced substantial and pervasive improvements in outcomes for first-time ninth grade students in very low-performing high schools. Using an unusually rigorous research method, MDRC found that the TD model that combines career academies in grades ten through twelve with a ninth grade freshman academy showed substantial gains in attendance, academic course credits earned, and promotion rates during the students' first year of high school. These effects emerged in the first year of implementation and were reproduced as the model was extended to other schools in the district and as subsequent cohorts of students entered the ninth grade.[15]

The TD model's strong positive effects during the first year of high school are consistent with the model's intensive initial focus on the ninth grade and its emphasis on combining high-quality curricular and instructional enhancements with pervasive structural reforms aimed at building supportive, personalized learning environments. The CPA model offers four out of the five main features of the TD model. Therefore, by including ninth graders in CPAs, one could expect positive results similar to those obtained from the TD model.

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[13] James Kemple, Corinne Herlihy, and Thomas Smith. *Making Progress Toward Graduation: Evidence from the Talent Development High School Model*, New York: MDRC, 2004.
[14] James Kemple, and Corinne Herlihy, *The Talent Development High School Model: Context, Components, and Initial Impacts on Ninth-Grade Students' Engagement and Performance*. New York: MDRC, 2004, p. iii.
[15] Ibid.

Statewide Network That Connects the Mathematics Curriculum to the Workplace

Subcommittee 1 believes that California needs to establish a statewide network to help high school teachers connect the curriculum to the workplace. After exploring different models and methods of applying the academic content standards to the workplace, Subcommittee 1 decided to narrow the focus to one academic subject, mathematics. The need to focus on mathematics is well supported in the research. Listed next are some alarming facts from studies conducted by the Programme for International Student Assessment (PISA).[16]

Results of a comparison of mathematical literacy and problem-solving performances of fifteen-year-olds in 39 countries showed that mathematical literacy scores of U.S. students, 61 percent of whom were in the tenth grade, were significantly below those of students from 24 other countries who participated in the study. U.S. students' scores in problem solving were significantly lower than those of their peers in 25 countries.

Looking at what students are able to do with their knowledge of mathematics and science, PISA concluded that American fifteen-year-olds are in an international cellar in demonstrating their ability to draw on the mathematical knowledge and skills that they learned from textbook exercises and their ability to apply that material to new situations.

Cited next are additional facts that support the need to focus on mathematics.

On a test of general knowledge in mathematics and science, U.S. twelfth graders recently performed below the international average for 21 countries.[17]

Less than one-third of U.S. fourth grade and eighth grade students performed at or above a level called "proficient" in mathematics. *Proficiency* is the ability to exhibit competence with challenging subject matter. About one-third of the fourth graders and one-fifth of the eighth graders lacked the competence to perform basic mathematical computations.[18]

The focus on mathematics was also addressed in President Bush's 2006 State of the Union Address, in which he stated that one of his goals was to prepare America to compete in the world. To accomplish this goal, he announced his American Competitiveness Initiative (ACI). One of the intents of the ACI is to "provide American children with a strong foundation in mathematics and science." The ACI points out the need to improve the quality of mathematics, science, and technological education in kindergarten through grade twelve and the need to engage every child in rigorous courses that teach important analytical, technical, and problem-solving skills.[19] President Bush said, ". . . we need to encourage children to take more math and

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[16] *Handbook for a Commitment to America's Future: A Toolkit for Leaders of State-level P-16 Councils*. Washington, D.C.: The Business-Higher Education Forum, 2005.

[17] "*Rising Above The Gathering Storm: Energizing and Employing America for a Brighter Economic Future*. Washington, D.C.: National Academy of Sciences, 2005.

[18] Ibid.

[19] Office of the Press Secretary, "State of the Union: American Competitiveness Initiative." Washington, D.C.: The White House, January 31, 2006.

science and to make sure those courses are rigorous enough to compete with other nations." He stated further, "If we ensure that America's children succeed in life, they will ensure that America succeeds in the world."[20]

Taking rigorous mathematics courses also plays an important role in college success. According to the article "A New Core Curriculum for All: Aiming High for Other People's Children," the single best predictor of college success is "the quality and intensity of the student's high school courses." This article also states, "The relationship of high school course-taking to college success is clearest in mathematics. High school students who complete math higher than Algebra 2 (for example, trigonometry, or calculus) double their chances for earning a college degree."[21]

Findings from research studies suggest that connecting the curriculum to the workplace can be accomplished through educator and business partnerships that support and integrate academics that focus on the real world and careers. *Learning for the 21st Century* states that "schools must reach out to their communities, employers, community members and, of course, parents to reduce the boundaries that divide schools from the real world."[22] *Breaking Ranks II: Strategies for Leading High School Reform* recommends that "high schools develop political and financial relationships with individuals, organizations, and businesses to support and supplement educational programs and policies."[23]

Research shows that connecting the curriculum to the workplace and using real-world or authentic applications are effective ways to make the curriculum relevant to students. This curriculum approach is also a characteristic of high-performing high schools. Creating partnerships between schools and community members and the need to focus on mathematic standards is also supported by research.

The San Bernardino County Superintendent of Schools administers a program that connects teachers with business and labor partners to create examples of an authentic mathematics application that teachers can use in their high school mathematics classes. The program, called **A**pplications by **B**usiness and **L**abor for **E**ducators (ABLE), efficiently communicates the mathematics standards to business and labor partners so that examples of authentic mathematics applications can be easily developed (see appendixes 2, 3, and 4). Only teachers in school districts in San Bernardino County have access to this program.

Subcommittee 1 found that the San Bernardino County Superintendent of Schools' ABLE program met the three program criteria listed under the section "Findings from Research Studies," which appears earlier in this report.

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[20] George W. Bush "State of The Union Address by the President." Address given at the United States Capitol, Washington, D.C., January 31, 2006.
[21] "A New Core Curriculum for All: Aiming High for Other People's Children," *The Education Trust*, Vol. 7, No. 1 (winter 2003), 1–2.
[22] *Learning for the 21st Century,* pp. 4–5.
[23] *Breaking Ranks II,* p. 65.

Recommendation 2

On the basis of the preceding research, Subcommittee 1 offers the following recommendation:

Expand the San Bernardino County Superintendent of Schools' ABLE program throughout the state. This expansion will establish a statewide network of local business, labor, and education partnerships to connect the mathematics curriculum to the workplace. This network will assist teachers in connecting with business and labor partners to create examples of authentic applications of the mathematics curriculum that teachers of high school mathematics can use in their classes. The statewide network will have the following components:

1. A project coordinator for each local partnership who will:

    a. Facilitate and oversee the process and development of the authentic mathematics applications.

    b. Oversee the compilation and archiving of the work.

2. The examples of authentic mathematics applications will be:

    a. Cross-referenced with mathematics content standards (the standards used will be identified.)

    b. Organized by industry sectors

    c. Compiled in a database located at a County Office of Education or a Regional P-16 Council

    d. Archived on the CDE Web site for statewide access by all educational systems

3. Funding will be allocated to conduct a long-term evaluation of the statewide network project to assess its effectiveness on student learning.

This statewide network will allow educators across the state to have access to examples of authentic mathematics applications, and it will identify business and labor partners who are eager to discuss the real-world applications of the classroom mathematics curriculum. This statewide network will be a powerful tool for educators in rural areas that do not have access to local business partnerships. It will also serve as a model for making the classroom curriculum relevant for students, and it can be expanded to other core academic subjects.

APPENDIXES

Appendix 1. Summary of Data from the 2003-04 Annual Report for California Partnership Academies

Appendix 2. Alliance for Education pamphlet

Appendix 3. ABLE Process Path

Appendix 4. ABLE Template – Algebra 1, Standard 5

Summary of Data from the 2003-04 Annual Report for California Partnership Academies

The data in this appendix are from the 2003-04 California Partnership Academies (CPAs) annual report, which includes data from 264 academies. Today there are 286 active academies. For the school to receive funding for a student in an academy, the student must attend school 80 percent of the year and complete 90 percent of his or her coursework. In the senior year, an academy student must graduate to qualify for funding. The figures that follow are for the whole group and for grades ten, eleven, and twelve.

Data for All Students During 2003-04

Total number of students served by the CPAs in 2003-04	31,591
Total number of students who met criteria for funding	26,672
Percentage of students who met criteria for funding	84

Grade Ten

Total number of students served	12,008
Number of students who met the attendance requirement	11,423
Percentage of students who met the attendance requirement	95
Number of students who completed 90 percent of the coursework	9,561
Percentage of students who completed 90 percent of the coursework	80

Grade Eleven

Total number of students served	10,613
Number of students who met the attendance requirement	10,123
Percentage of students who met the attendance requirement	95
Number of students who completed 90 percent of the coursework	8,923
Percentage of students who completed 90 percent of the coursework	84

Grade Twelve

Total number of students served	8,970
Number of students who graduated	8,541
Percentage of students who graduated	95

Note: This summary was obtained from Bernie Norton, CDE Manager for the High School Initiatives/Career Education Office on December 6, 2005.

Making the Connection!
Three Business/Labor/Education Instructional Strategies

Alliance For Education
Linking Learning to Living

The Speaker's Bureau (*A.B.L.E. Process)
Classroom speaking is an instructional strategy that has been successfully used for years to bring information from the community and business/labor leaders to students in classrooms. In the classroom speaking strategy, visiting business/labor/community partners incorporate how they use academics within their career field or place of work. The partner works closely with the educator prior to the classroom presentation in order to learn more about the content standards the educator is required to teach, as well as core concepts that students need to understand to successfully achieve on standardized testing. With this knowledge, the partner incorporates some of the standards or core concepts in his or her presentation.

The Field Study Program (*A.B.L.E. Process)
The Field Study Program is an instructional strategy that successfully demonstrates to students the relevance of their academic subjects to the world of work. Through the Field Study Program business/labor/community partners demonstrate how they use academics within their career field or place of work. The Field Study Program expands upon the field trip concept, allowing students to visit a business/industry site for an organized tour of the site, where a demonstration of how that particular business/industry uses academic knowledge and skills to accomplish necessary work. The partner works closely with the educator prior to the field study in order to learn more about the content standards the educator is required to teach, as well as core concepts that students need to understand to successfully achieve on standardized testing. With this knowledge, the partner incorporates some of the standards or core concepts in the field study and provides a hands-on activity or task in which the students apply these standards.

Project/Problem-Based Learning
Project/Problem-Based Learning is an instructional strategy that successfully demonstrates to students the relevance of their academic studies within an authentic, problems-solving situation. The Project/Problem-Based Learning experience allows students to tackle an authentic problem or project provided by a business or community leader. After researching the problem by gathering data and information, or working on the project, students present the suggested solutions to the partner. The partner works closely with the educator prior to the project design or determined problem-solving activity in order to learn more about the content standards the educator is required to teach, as well as core concepts that students need to understand to successfully achieve on standardized testing. With this knowledge, the partners incorporate some of the standards or core concepts in the project or problem-based learning activities.

The intent of these three strategies is to demonstrate to students the relevance of their academic subject areas to the world of work and increase their awareness of the importance of their academic studies to their future goals or plans.

*A.B.L.E. = Applications by Business and Labor for Educators

Leslie Rodden, Coordinator
San Bernardino County Superintendent of Schools
601 North E Street San Bernardino, Ca 92410
(909)386-2636

How It Works

You can play a vital part in students' lives by bringing relevance to their academic studies! Become a partner of the Alliance for Education and participate in one of the instructional strategies: Speakers' Bureau, Field Study and Project-Problem Based Learning.

The following describes the general involvement and time commitment:

(1) Get connected to a teacher by calling the Business Community Liaison for the Alliance for Education (Contact information listed below or register online at **www.sbcalliance.org**).

(2) Talk with the teacher (in person, by e-mail or by phone) to receive information on the academic standards that need to be included in the learning activity (Approximately 1 hour).

(3) In partnership with the teacher, design the Speakers' Bureau presentation, Field Study or Project/Problem-Based Learning activity for the students (1 to 2 hours).

(4) Fill out a form provided by the teacher that identifies the instructional strategy that will be accomplished (20 minutes).

(5) Be available to speak to the students in the classroom (Speakers' Bureau), or at your business/industry site (Field Study), or in the classroom when you provide a business problem or project idea to the students (Project/Problem-Based Learning). (1 hour minimum, depending on how many classes participate).

Two additional steps for the Project/Problem-Based Learning experience:

(6) Be available by phone or e-mail for any follow-up questions by the students or teacher (15 - 30 minutes).

(7) Return at a later date to hear the students' presentation on their possible solutions to the problem or project accomplishments (1 hour minimum, depending on how many classes participate).

By investing only 3-5 hours of your time a year, you have the opportunity to impact students' lives by bringing relevance to their academic studies and helping them better prepare for the work place.

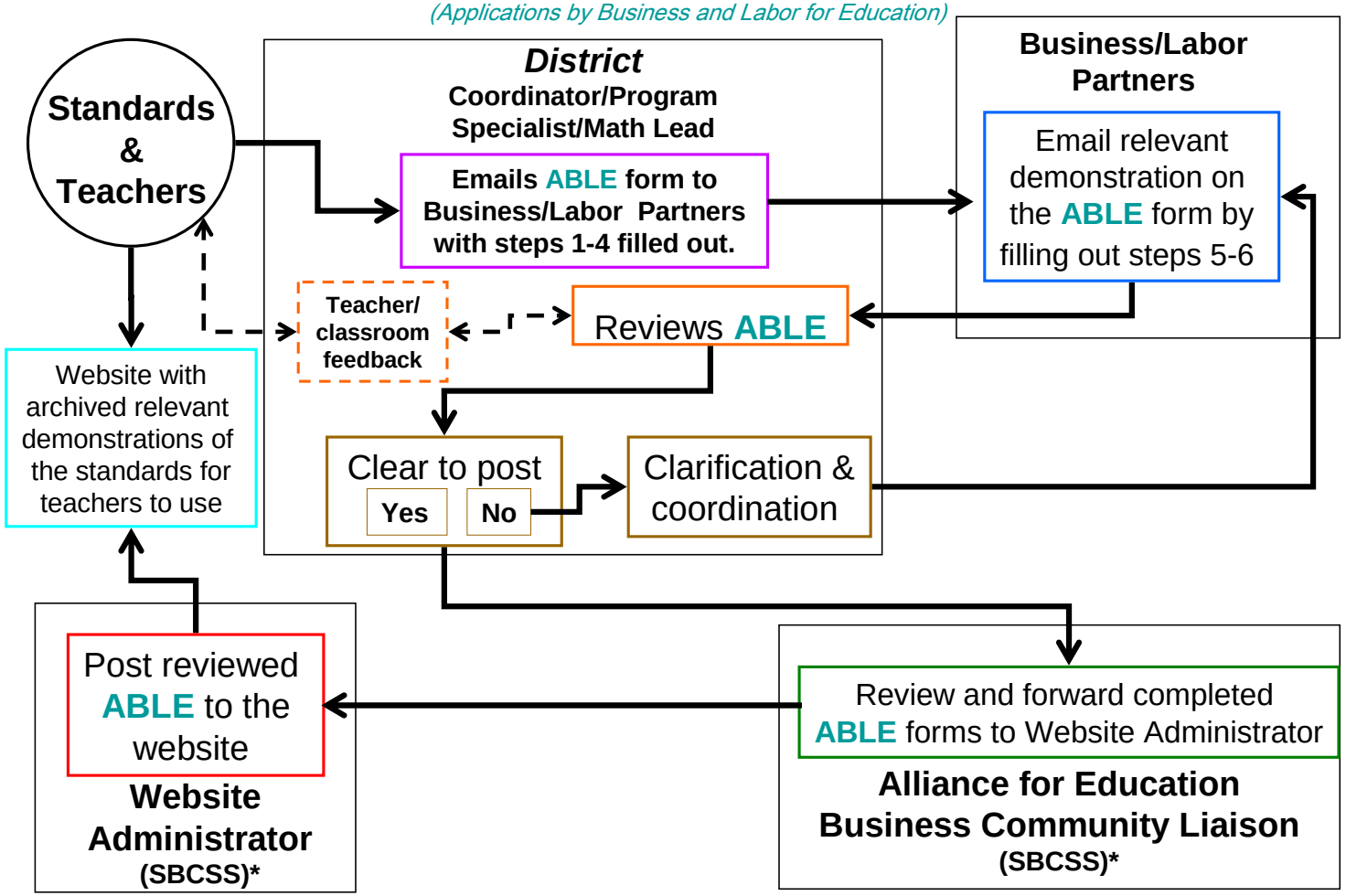
Kevin Baker
Business Community Liaison
(909) 386-2636
Kevin_Baker@sbcss.K12.ca.us

www.sbcalliance.org

This project is supported be the James Irvine Foundation, the Community Foundation, MPR Association, and ConnectEd • Sponsors: Lewis Operating Corporation •Arrowhead Credit Union • Federal Earmark Funding Program – supported by 60% Federal Funding (FY 05-06). Total Federal Funding of program - $598,043 (FY 04-06). Funding from non-governmental sources - $267,000, 45% (FY 03-06) • Partners in Making the Connection: • Economic Development Agency • Workforce Investment Board

ABLE Process Path

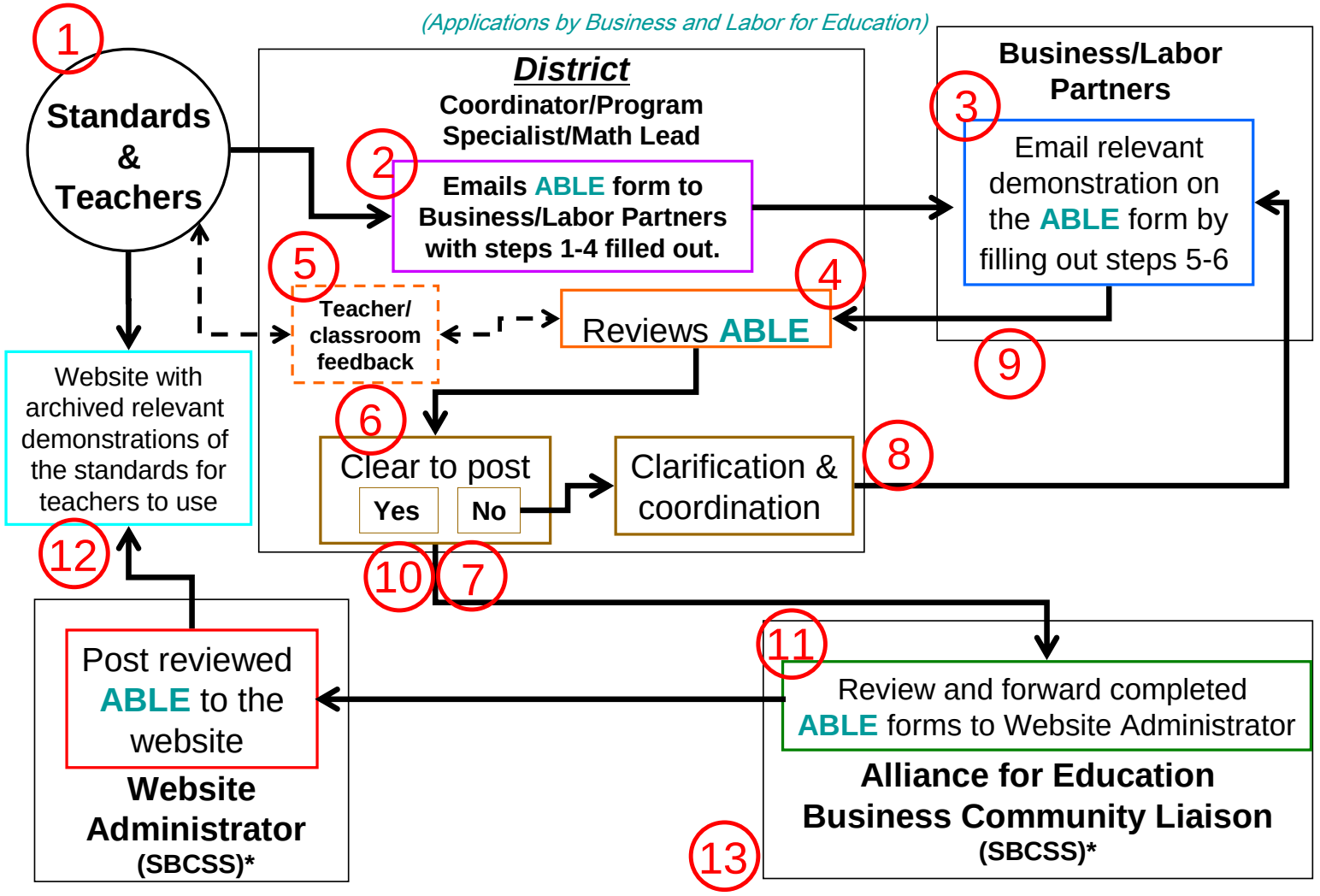
(Applications by Business and Labor for Education)



* San Bernardino County School Superintendent of Schools

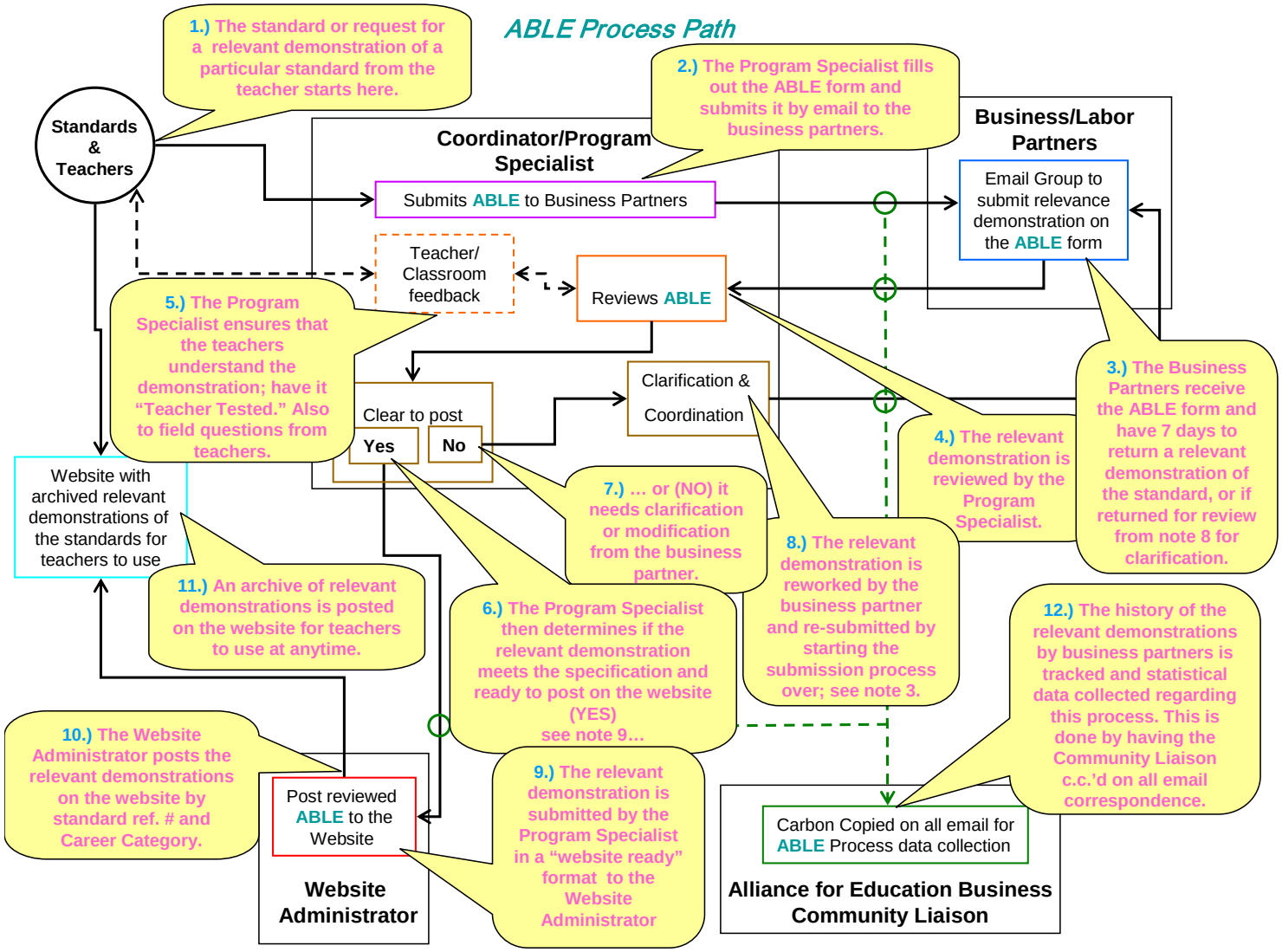
ABLE Process Path

(Applications by Business and Labor for Education)



* San Bernardino County Superintendent of Schools

1. **The standard or request for a relevant demonstration of a particular standard from the teacher starts with the teachers and the standards they must teach.**
2. **The Coordinator/Program Specialist/Math Lead fills out the ABLE form, sections 1-4, and submits it by email to the Business/Labor Partners.**
3. **The business/labor partners receive the ABLE form and have 7 days to return the form with steps 5-6 filled out for the relevant demonstration of the standard.**
4. **The relevant demonstration is reviewed by the Coordinator/Program Specialist/ Math Lead.**
5. **The Coordinator/Program Specialist/Math Lead ensures that the teachers understand the demonstration; it is "Teacher Tested" and questions are clarified for teachers from the Business/Labor Partner.**
6. **The Coordinator/Program Specialist/Math Lead then determines if the relevant demonstration meets the specifications and is ready to post on the website.**
7. **If so, the ABLE form is forwarded to the Business Community Liaison.**
8. **Or, if the relevant demonstration needs clarification or modification, it is emailed back to the Business/Labor Partner to clarify.**
9. **After the relevant demonstration is reworked by the Business/Labor Partner, the ABLE form starts the submission process over.**
10. **Then the clarified demonstration is submitted to the Business Community Liaison, as in step 7 for those demonstrations already cleared to post.**
11. **The Business Community Liaison then reviews the ABLE form and forwards it to the Website Administrator for posting by standard number and career category.**
12. **An archive of relevant demonstrations is posted on the website for teachers to use anytime.**
13. **The history of the relevant demonstrations by Business/Labor Partners is tracked and statistical data collected regarding this process by the Business Community Liaison.**


ABLE Process Path
1.) The standard or request for a relevant demonstration of a particular standard from the teacher starts here.
Standards & Teachers
2.) The Program Specialist fills out the ABLE form and submits it by email to the business partners.
Coordinator/Program Specialist
Submits ABLE to Business Partners
Business/Labor Partners
Email Group to submit relevance demonstration on the ABLE form
Teacher/ Classroom feedback
Reviews ABLE
5.) The Program Specialist ensures that the teachers understand the demonstration; have it "Teacher Tested." Also to field questions from teachers.
Clear to post
Yes
No
Clarification & Coordination
4.) The relevant demonstration is reviewed by the Program Specialist.
3.) The Business Partners receive the ABLE form and have 7 days to return a relevant demonstration of the standard, or if returned for review from note 8 for clarification.
Website with archived relevant demonstrations of the standards for teachers to use
7.) … or (NO) it needs clarification or modification from the business partner.
8.) The relevant demonstration is reworked by the business partner and re-submitted by starting the submission process over; see note 3.
11.) An archive of relevant demonstrations is posted on the website for teachers to use at anytime.
6.) The Program Specialist then determines if the relevant demonstration meets the specification and ready to post on the website (YES) see note 9…
12.) The history of the relevant demonstrations by business partners is tracked and statistical data collected regarding this process. This is done by having the Community Liaison c.c.'d on all email correspondence.
10.) The Website Administrator posts the relevant demonstrations on the website by standard ref. # and Career Category.
Post reviewed ABLE to the Website
Website Administrator
9.) The relevant demonstration is submitted by the Program Specialist in a "website ready" format to the Website Administrator
Carbon Copied on all email for ABLE Process data collection
Alliance for Education Business Community Liaison

ABLE Template
(Applications by Business and Labor for Educators)
ALGEBRA 1
STANDARD 5

1. Contact Information	
Submission Date: Jan.23, 2006	**Academic Standard Reference:** Std. 5
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Business/Labor Partner: San Bernardino City Professional Firefighters	
Point of Contact: Tom Rubio	**Phone:**
	Email:

2. Algebra Standard:
(Std. 5): Students solve multi-step problems, including word problems, involving linear equations and linear inequalities in one variable and provide justification for each step.

Standard Unpacked:

1. Students solve multi-step linear equations in one variable.
2. Students solve multi-step linear inequalities in one variable.
3. Students solve word problems involving linear equations.
4. Students solve word problems involving linear inequalities.
5. Students provide justification for each step in a multistep problem

(Due to the number of components in the California Algebra 1 Content Standards, this document may not address every aspect of the specified standard. The underlined component(s) is/are the portion of the standard that is/are addressed in this template. The focus is chosen based on the standard's relevance to Algebra 1 CST and/or CAHSEE* released questions.)*

3. Explanation of Standard:
Std. 5: This standard consists of 6 components, two of which are covered in this template (multi-step equations and word problems that involve equations).
The following provides the steps for solving this type of problem:
You and three friends are having lunch at a restaurant that charges $2 per plate. The waiter gives you a bill for $25.20, which includes tax of $1.20. Write and solve an equation to determine the number of plates ordered. This can be done using an algebraic model:

Step 1. Write a **verbal model** for the situation. Shade the box with the unknown amount.

Cost per	.	Number of plates	=	Bill	-	Ta

Step 2. **Assign labels**.

Cost per plate = 2 (dollars)
Number of plates = p
Amount of bill = 25.20 (dollars)
Tax = 1.20 (dollars)

Step 3. Write an **algebraic model** and solve.

$$2p = 25.20 - 1.20$$
$$2p = 24.00$$
$$p = 12$$

Your group ordered 12 plates of food. (Student must be able to explain what the answer means in terms of the problem)

4a. Sample Textbook Application Problem that Illustrates the Standard:

A video store charges $8 to rent a video game for five days. You must be a member to rent from the store, but the membership is free. A video game club in town charges $3 to rent a game for five days, but membership in the club is $50 per year. Which rental plan is more economical?

Answer: *After 10 rentals the video game club is cheaper.*

(McDougal Littell, Algebra 1 Applications, Equations, Graphs)

4b. Sample Released Algebra 1 CST and/or CAHSEE Application Problem that Illustrates the Standard:

From Algebra 1 CST:
A 120-foot-long rope is cut into 3 pieces. The first piece of rope is twice as long as the second piece of rope. The third piece of rope is three times as long as the second piece of rope. What is the length of the longest piece of rope?
A 20 feet
B 40 feet
C 60 feet
D 80 feet

From CAHSEE:
Colleen solved the equation 2(2x+5) = 8 using the following steps.

Given: 2 (2x+5) = 8
Step 1: 4x +10 = 8
Step 2: 4x = -2
Step 3: x = -1/2
To get from Step 2 to Step 3, Colleen-
A divided both sides by 4.
B subtracted 4 from both sides.
C added 4 to both sides.
D multiplied both sides by 4.

Note: This problem addresses the "provide justification component" of the standard.

5. Business/Labor Partner Application of the Academic Standard:
Please provide another application of this standard that demonstrates the authentic use of this standard within your field or line of work

If the total engine pressure is set correctly at 115 psi and the hoseline is being operated on the top of a hill, what is the height of the hill if a 50 psi nozzle is being used?

Remember : $n = t - \frac{h}{2}$

$t = 115, n = 50$

$$50 = 115 - \frac{h}{2}$$

$$-65 = -\frac{h}{2}$$

$$130 \text{ ft} = h$$

6. Business/Labor Partner "Hands-On" Demonstration of the Academic Standard:
How would this authentic application be demonstrated in the classroom or at your place of business/industry? What type of hands-on activity or task might the students do?
A fire engine pumper will be used to show pressure gauges the Engineer utilizes to adjust to corresponding pressure changes made to increases or decreases in elevation of the hoseline above or below the fire truck pump. This represents the fact that if a Firefighter advances a hoseline upward, i.e. a multi-story building or down a hillside, that a pressure loss on the hoseline will occur when the hoseline is advanced upward from the fire engine. A pressure increase will also occur if the hoseline is advanced down a grade such as a basement or hillside.

A volunteer student will be chosen to hold an actual fire hose line. The Engineer

will use the fire engine pump to build, increase and decrease pressure. The scenario is that the Firefighter (student volunteer) has advanced the hoseline up a hill. If the total engine pressure is 100 and the hoseline is at the top of the hill, and a 100 psi nozzle is used, what is the height of the hill?
For safety purposes water is to be flowed from the hoseline at a simulated predetermined pressure of 25 psi.

As water is being flowed, the Engineer will explain to the student audience that a change in height has occurred. The Firefighter (student) has now either moved the hoseline up an additional 50 feet or has gone down the hillside 50 feet. If the scenario of an increase in height has occurred, the student volunteer will feel a slight increase in manageability of the hoseline due to the fact that the Engineer has increased the pressure to overcome the loss due to the height increase.
NOTE: **Engineer will increase the actual pressure from 25 psi on the gauge to 35 psi. If the decrease in height scenario is used, then the Engineer will decrease the pressure from 25 to 20 psi on the gauge and the volunteer student will feel an increase in manageability of the hoseline.**

The Engineer will now have the student volunteer describe the nozzle and hose line reactions he/she felt when the **simulated** total engine pressure of **25 psi** was either increased to 35 psi for an increase in elevation or when the total engine pressure was decreased to 20 psi for a decrease in elevation.

This demonstration will show that determining the height of the hoseline, above or below the fire pump, is a useful tool. The Engineer is responsible to make changes to total engine pressure so that the Firefighter on the hoseline can manage the hoseline safely to maximize the firefighting efforts.

Questions and answers from student audience to Engineer.

- Fire truck pump
- Hose line
- Engine, nozzle pressure and reactions
- Need to know estimate changes in height-rule of thumb (10-12 ft per floor height)
- Engineer's short cuts-0.5 psi/floor. Estimating pressure losses/gains due to lengths of hoses in 50 and 100 foot increments
- Algebra and fire ground hydraulics

7. Review, Questions and Comments from Coordinator/Program Specialist:

*CST= California Standardized Test
*CAHSEE = California High School Exit Exam

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